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10/531,467	04/15/2005	Osamu Kawai	270649US0PCT	1368

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EXAMINER	
BERNSHTEYN, MICHAEL	

ART UNIT	PAPER NUMBER
1713	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/531,467	KAWAI ET AL.	
	Examiner	Art Unit	
	Michael Bernshteyn	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 February 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-7 and 9-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-7 and 9-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office Action follows a response filed on February 20, 2007. Claims 1, 3-6 and 9 have been amended; claims 2 and 8 have been cancelled; claims 15-19 have been added.

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 19, 2007 has been entered.

3. In view of the amendment(s) and remarks, the rejection of claims 1, 3-7 and 9-14 under 35 U.S.C. 102(b) as being anticipated by Masuda et al. (JP 2002-256128) and the rejection of claims 1 and 3-7 under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S. Patent 5,726,268) in view of Masuda et al. (JP 2002-256128) have been withdrawn.

Applicant's arguments with respect to claims 1, 3-7 and 9-14 have been considered but are moot in view of the new ground(s) of rejection.

4. Claims 1, 3-7 and 9-19 are pending.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1, 3-6 and 9-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims recite, "a sheet", but the specification does not contain the definition of this subject matter at all.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 7 and 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The recitation of "the resin for light guiding plates as claimed in claim 1"in claim 7 is indefinite because the amended claim 1 does not contain any resin.

The recitation of "further comprising, after polymerizing the polymerizable material, forming a light entrance in the second mixture" in claim 19 is indefinite because it is not clear as to the meaning of "a light entrance". The specification does not further define "a light entrance". Therefore, this terminology is indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim Rejections - 35 USC § 102

7. The text of this section of Title 35 U.S.C. not included in this action can be found in a prior Office Action.

Claim Rejections - 35 USC § 103

8. The text of this section of Title 35 U.S.C. not included in this action can be found in a prior Office Action.

9. Claims 1, 3-7, 9-14 and 16-18 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Masuda et al. (JP 2002-256128).

With regard to the limitations of claims 1, 3-7 and 16-18, Masuda discloses methacrylic resin composition with inorganic particles, which are selected from the group consisting of **silica, titanium oxide, barium sulfate, calcium carbonate, methacrylic resin, styrene resin, and silicone resin**, or two sorts or more (page 2, [claim 2]). The composition contains 100,000-1,000,000 fine particles having particles size of **0.5-1.0 μm**, which is within the claimed ranges. The composition is suitable for producing a backlight of a homogeneous liquid crystal display exhibiting a high luminance and a low unevenness in luminance (abstract).

Masuda discloses that **methyl methacrylate polymer** comprising methyl methacrylate units as a primary component, preferably not less than 70% by weight. Methyl methacrylate units may partially be replaced by a **monofunctional unsaturated monomer** unit, which is copolymerizable with methyl methacrylate. The content of the

copolymerizable, monofunctional unsaturated monomer unit in the polymer is preferably **not less than 0.2% by weight**, which is within the claimed range. Examples of copolymerizable, monofunctional unsaturated monomer which forms the monofunctional unsaturated monomer unit include: **2-ethylhexyl methacrylate**, 2-hydroxyethyl methacrylate, butyl methacrylate, benzyl methacrylate, **methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate,** etc. Example of the **polyfunctional methacrylate** includes **neopentyl methacrylate** (page 4, [0013]).

With regard to the limitations of claims 9-14, Masuda discloses the transparent material, which can be produced using the **mixture** of methacrylic resin and particles by injection molding, extrusion **molding**, etc. which carry out melting kneading and are generally used (page 6, [0020]). The dispersing agent (particle) shown in table 1 was added in examples 1-8 to methacrylic resin, kneading extrusion and the extruded strand were palletized with the extruder with the temperature 240^{0}C and screw speed 200 rpm (page 6, [0023]-[0026], Table 1, page 8, [0028]).

Regarding the limitations for the sheet for light guiding plate comprising a polymer, in view of substantially identical monomers, such as methyl methacrylate , monofunctional acrylate and a polyfunctional methacrylate, combined content of the monofunctional acrylate and polyfunctional methacrylate within the claimed range, a particulate diffusing agent, its amount within the claimed range, process producing such products being used by both Masuda and the applicant, it is the examiner position to believe that the product of Masuda (see drawing 1, page 7 and abstract) is substantially the same as the sheet for light guiding plate comprising a polymer and a particulate

diffusing agent recited in claim 1, even though obtained by a different process, consult ***In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).***

Since the USPTO does not have proper equipment to do the analytical test, the burden is now shifted to the applicant to prove otherwise.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." ***In re Thorpe***, *777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985*).

10. Claims 1, 3-7 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S. Patent 5,726,268) in view of Masuda et al. (JP 2002-256128).

With regard to the limitations of claims 1, 3 and 5, Sakamoto discloses light guide members as extruded sheets comprising **methyl methacrylate polymer** comprising methyl methacrylate units as a primary component not less than 50% by weight, preferably **not less than 70% by weight** (abstract, col. 2, lines 14-16). Methyl methacrylate units may partially be replaced by a **monofunctional unsaturated monomer** unit, which is copolymerizable with methyl methacrylate (col. 2, lines 19-21). The content of the copolymerizable, monofunctional unsaturated monomer unit in the polymer is preferably not less than 1% by weight, more preferably **not less than 3% by weight** (col. 2, lines 26-30). Examples of copolymerizable, monofunctional unsaturated

monomer which forms the monofunctional unsaturated monomer unit include: methacrylates, such as ethyl methacrylate, propyl methacrylate, butyl methacrylate, and benzyl methacrylate; acrylates, such as **methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, and 2-ethylhexyl acrylate**, etc. (col. 2, lines (45-67).

The methyl methacrylate polymer can be obtained by polymerizing the monofunctional monomer with a predetermined amount of a monomer, which forms polyfunctional structural unit, and further a chain transfer agent and/or a polymerization initiator according to the requirements (col. 4, lines 10-15). The monomer, which forms polyfunctional structural unit, is usually a **polyfunctional monomer,** which has at least two double bonds in its molecule and is copolymerized with methyl methacrylate. Content of the polyfunctional monomer is generally from 0.02 to 0.3%, preferably **from 0.05 to 0.2% by weight** in the polymer; which is within the claimed range. Examples of the polyfunctional monomer include: esters of ethylene glycol and of oligomers of ethylene glycol having two or more hydroxyl groups esterified by acrylic acid or methacrylic acid, such as **ethylene glycol di(meth)acrylate**, diethyene glycol di(meth)acrylate, triethylene glycol di(meth)acrylate, tetraethylene glycol di(meth)acrylate, etc. (col. 4, lines 20-43).

Sakamoto discloses that a variety of **other agents** generally used for acrylic resins, for example, mold parting agents, ultraviolet light absorbers, coloring agents, antioxidants, heat stabilizers, and plasticizers, may be added to the methyl methacrylate polymer, for example, **another acrylic resin** may be added to the methyl methacrylate polymer for better impact resistance and/or heat resistance (col. 6, lines 1-8). Different resins are described as diffusing agents in the specification (page 5, lines 16-23).

With regard to the limitations of claims 1, 4, 6 and 7, Sakamoto does not disclose that the particulate diffusing agent comprises inorganic particles and the particle size.

Masuda discloses the methacrylic resin composition with inorganic particles, which are selected from the group consisting of **silica**, **titanium oxide**, barium sulfate, calcium carbonate, methacrylic resin, styrene resin, and silicone resin, or two sorts or more (page 2, [claim 2]). The composition contains 100,000-1,000,000 fine particles having particles size of 0.5-1.0 μm, which is within the claimed ranges (abstract).

Both references are analogous art because they are from the same field of endeavor concerning new methacrylic resin compositions, which are suitable for producing light guide plate.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate inorganic particles, which are selected from the group consisting of silica, titanium oxide, barium sulfate, calcium carbonate, etc. having particles size of 0.5-1.0 μm in the adjusted amount as taught by Masuda in Sakamoto's methacrylic resin composition in order to obtain a methacrylic resin composition, which is suitable for producing a back light of a homogeneous liquid crystal

display exhibiting a high luminance and a low unevenness in luminance (JP'128, abstract), and thus to arrive at the subject matter of instant claims 1, 4, 6 and 7.

With regard to the limitations of claim 15, Sakamoto discloses that examples of the polyfunctional monomer include: esters of ethylene glycol and of oligomers of ethylene glycol having two or more hydroxyl groups esterified by acrylic acid or methacrylic acid, such as **ethylene glycol di(meth)acrylate**, diethyene glycol di(meth)acrylate, triethylene glycol di(meth)acrylate, tetraethylene glycol di(meth)acrylate, etc. (col. 4, lines 23-43).

With regard to the limitations of claim 16, Sakamoto discloses that examples of copolymerizable, monofunctional unsaturated monomer which forms the monofunctional unsaturated monomer unit include: methacrylates, such as ethyl methacrylate, propyl methacrylate, butyl methacrylate, and benzyl methacrylate; acrylates, such as **methyl acrylate, ethyl acrylate, propyl acrylate, butyl acrylate, and 2-ethylhexyl acrylate**, etc. (col. 2, lines (45-67).

With regard to the limitations of claims 17 and 18, Sakamoto discloses that the content of the copolymerizable, monofunctional unsaturated monomer unit in the polymer is preferably not less than 1% by weight, more preferably not less than 3% by weight, which is within the claimed range (col. 2, lines 26-30).

11. Claims 1, 3-7 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al. (WO 02/39153) in view of Hasegawa et al. (JP 60-258219). The U.S. Patent 6,941,056 is equivalent to the WO 02/39153; therefore, the following rejection is based upon the context of U.S. Patent 6,941,056.

With regard to the limitations of claims 1, 6, 7 and 16, Hirota discloses **a light guiding plate**, characterized by comprising a transparent thermoplastic resin composition containing **1-200 ppm** of fine particles having a refractive index of 1.7-3.0 and an average **particle diameter of 0.01-1.0 μm**, which is within the claimed range (abstract). In the drawing, A indicates a light source (a cold cathode-ray tube), B indicates a lamp house, C indicates a light guiding plate containing fine particles wherein the fine particles are not drawn to scale, D indicates **a light reflective sheet**, E indicates **a light diffusing sheet**, and F indicates a prism sheet. FIG. 2 shows a flow chart of an embodiment of the method of forming the light guiding plate (col. 2, lines 43-50).

As the methacrylic resins, there may be used copolymers of methyl methacrylate or ethyl methacrylate with a monomer copolymerizable therewith. The amount of methyl methacrylate or ethyl methacrylate is preferably not less than 70% by weight based on the weight of the copolymer. Examples of the monomer copolymerizable with methyl methacrylate or ethyl methacrylate are methacrylate esters such as butyl methacrylate, ethyl methacrylate, propyl methacrylate, cyclohexyl methacrylate phenyl methacrylate, 2-ethylhexyl methacrylate, etc.; acrylate esters such as methyl acrylate, ethyl acrylate, **butyl acrylate**, cyclohexyl acrylate, phenyl acrylate, 2-ethylhexyl acrylate, etc. (col. 2, line 66 through col. 3, line 14).

With regard to the limitations of claims 1 and 15, Hirota does not disclose the usage of polyfunctional (meth)acrylate.

Hasegawa discloses a uniform methacrylic partial polymer consisting of (A) monomethylenically unsaturated monomer consisting essentially of methyl methacrylate in the amount of 90-99.7% by weight, and (B) crosslinking monomer, preferably **ethylene glycol di(meth)acrylate**, neopentyl glycol di(meth)acrylate, pentaerythritol tri(meth)acrylate and trimethylolpropane tri(meth)acrylate, which is hardened under pressing and heating conditions in the presence of a radical polymerization initiator in a mold (abstract).

Both references are analogous art because they are from the same field of endeavor concerning polymerizable methacrylate compositions for light guiding plate.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate polyfunctional (meth)acrylate such as ethylene glycol di(meth)acrylate, as taught by Hasegawa in Hirota's thermoplastic resin composition for the light guiding plate in order to obtain the composition having low birefringence and improved strength and solvent resistance, by hardening the methacrylic partial polymer consisting essentially of methyl methacrylate and the crosslinking monomer (JP'219, abstract), and thus to arrive at the subject matter of instant claim 1 and dependent claim 15.

With regard to the limitations of claims 3 and 4, Hirota discloses that the fine particles have no special limitations, and examples thereof are aluminum trioxide, titanium **dioxide**, etc. (col. 5, lines 29-33).

With regard to the limitations of claim 5, Hirota discloses that as the transparent thermoplastic resin contained in the transparent thermoplastic resin composition, mention may be made of methacrylic resins, polycarbonate resins, **styrene resins**, cyclic olefin resins, amorphous **polyesters**, etc. Preferred are methacrylic resins, polycarbonate resins and cyclic olefin resins, and more preferred are **methacrylic resins** (col. 2, lines 59-65).

With regard to the limitations of claims 17 and 18, Hirota does not disclose the content of the monofunctional acrylate in the polymerizable material.

It is noted that the amount of the content of the monofunctional acrylate in the polymerizable material is a result effective variable, and therefore, it is within the skill of those skilled in the art to find the optimum value of a result effective variable, as per ***In re Boesch and Slaney*** 205 USPQ 215 (CCPA 1980). See also *Peterson*, 315 F.3d at 1330, 65 USPQ2d at 1382: "The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages."

12. Claims 9-14 rejected under 35 U.S.C. 102(b) as being anticipated by Hirota et al. (WO 02/39153). The U.S. Patent 6,941,056 is equivalent to the WO 02/39153; therefore, the following rejection is based upon the context of U.S. Patent 6,941,056.

The disclosure of Hiroto's reference resided in § 11 is incorporated herein by reference.

With regard to the limitations of claims 9-14, Hirota discloses that the method for producing the transparent thermoplastic resin composition has no special limitation as far as the fine particles are uniformly dispersed in the transparent thermoplastic resin.

However, preferably, the fine particles are previously uniformly dispersed in an organic liquid and the transparent thermoplastic resin composition is produced using the resulting dispersion. That is, for producing the transparent thermoplastic resin composition constituting the light guiding plate, it is preferred to uniformly disperse the fine particles in the transparent thermoplastic resin by previously dispersing the fine particles in an organic liquid. Furthermore, for uniformly dispersing the fine particles in the organic liquid, it is preferred to use an ultrasonic wave generating apparatus (col. 5, lines 42-55).

Hirota discloses that as methods for uniformly dispersing the fine particles in the transparent thermoplastic resin in the production of the transparent thermoplastic resin composition containing the transparent thermoplastic resin and the fine particles, the following methods can be exemplified (see col. 6, line 12 through col. 7 line 14).

Hjirota also discloses that the method for molding the light guiding plate has no special limitation, and there may be employed known methods, for example, (1) a method **of molding the transparent thermoplastic resin composition to a sheet by a sheet molding extruder or a press molding machine**, cutting the resulting sheet to a desired size, and subjecting the cut surface to abrasive working, (2) a method of molding the transparent thermoplastic resin composition by an injection molding machine having a mold, and (3) a method of dispersing the fine particles in a syrup containing a starting monomer for the transparent thermoplastic resin or a partial polymer, then polymerizing the monomer or the partial polymer by a casting method to obtain a **sheet-like molded article**, then cutting it to a desired size, and subjecting the cut surface to abrasive working. In case the light guiding plate is obtained by molding the transparent thermoplastic resin composition by a sheet molding extruder, a press molding machine, an injection molding machine having a mold, etc., from operational and economical view points, there may be employed a method including the steps of preparing a master batch pellet which has a higher concentration of the fine particles in the thermoplastic resin composition than the desired concentration and diluting to the desired concentration with transparent thermoplastic resin at the time of molding (col. 7, line 64 through col. 8, line 21).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Bernshteyn whose telephone number is 571-272-2411. The examiner can normally be reached on M-F 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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05/21/2007

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